placed in England except for patented apparatus or by gas concerns controlled by British capital. The National Physical Laboratory, the British institution corresponding to the Reichsanstalt of Germany and the U.S. National Bureau of Standards, gets the absurdly small sum of 20,000 dollars per year, while the "beer money" appropriated to technical schools of the second and third rank amounted in 1898–9 to 4,152,000 dollars and in 1899–1900 to 4,380,000 dollars.

That there is "something the matter" with English economics seems evident to an impartial observer. Public opinion is slowly awakening to a realising sense that in some unseen manner England is being fed, clothed, reorganised and educated by foreigners. Prominent Englishmen, whose warnings are sincere, are trying to tell her that decline is at hand unless she adopts a sweeping reform in the whole content of her educational system, so as to bring it into close relationship with present-day necessities.

The Englishman learns slowly; he prefers to use methods formerly successful in spite of the fact that they are inapplicable to-day; he is slow to disturb established tradition and can scarcely be made to believe that any new forces have entered into the struggle for industrial supremacy. The rest of the world is learning the value of technical training in its varied forms as a foundation for industrial success, but the English still cling to their antiquated ideas. England has not kept alive to the requirements of the new scientific age into which we are now being thrust; she has not recognised the close connection that exists between science and industry; she is, as it were, using mediæval methods in modern industrial warfare; by neglecting the technical education of her people, she has failed to train her industrial army. This alone explains at once her own decadence and the advance of Germany and the United States.

The educational status of England is far lower than many suppose. We are pleased to juggle with the names Eton, Rugby, Oxford and Cambridge, but we must remember that these schools are only for the highest social classes and are maintained to educate the English gentleman of rank, not the plain every-day Englishman, and have little or no good influence upon industrial or commercial life. Through their graduates, who influence much of the editorial writing in London, they are seriously impeding the advance of correct ideas by their ultra conservatism and even ignorance of the scientific spirit of the age. The whole trend of an Oxford or Cambridge education is away from the masses. The primary and grammar schools of England are not only weak and inefficient, but are partly under State and partly under religious control; public high schools, as Americans know them, are non-existent; the higher college and university training is mostly classical and out of harmony with modern necessities; technical education, which in Germany and the United States must be preceded by a good high-school course of study, follows in England a weak grammar school education. Outside of her college preparatory schools and her two universities, which reach only an exceedingly small fraction of her people, England provides educational facilities which are utterly inadequate, both in character and extent, to the enormous needs of her people. To a certain extent, the view of Dr. Johnson still prevails that education is "needed solely for the embellishments of life and is useless for ordinary vermin."

The temper of the British mind is against scientific and technical progress. Research work, which is really the guiding star for all human progress, is sadly neglected. New ideas are imported from Germany and the United States; they seem unable to germinate on British soil. London, which was the first city to be lighted by gas, is the last to accept electricity. Germany teaches England electrochemistry and the United States gives her lessons in electric traction. Low-grade technical schools, evening schools and polytechnics she has in abundance; but they train only the imitative, not the creative faculties. England hates the specialist; Germany glories in him. England relies upon the practical man; Germany upon the technically trained man. England exalts the "rule-of-thumb" method; Germany insists upon scientific accuracy. England has no national system of education; Germany has a highly organised, Government-controlled system; England places her technical training next above a weak elementary education; Germany, believing in specialised education, which must be concerted and not premature specialisation, places her technical training after a thorough general education.

The race for industrial supremacy is on; the first three places are undoubtedly held by England, Germany and the United States. In view of the need of economic progress, it is not difficult to see that the outcome of the feeling of unrest which now pervades the educational world will be the enlargement of the sphere of technical education. All the signs of the times point in this direction. The trained technical man is rapidly taking the place of the untrained man. No nation can successfully oppose this world-wide movement. When the philosophers, educators and economists have risen to a full comprehension of the meaning of the present world-wide educational unrest, they will see that the solution of their doubts and anxieties lies in a fuller and more comprehensive development of the sphere of technical education.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—On Saturday last, Mr. H. Brereton Baker, F.R.S., Balliol College, was elected to the Lees readership in Chemistry, which had become vacant owing to Mr. Vernon Harcourt's resignation. Mr. Baker came up to Balliol as a Brackenbury scholar in 1880, and took a "first" in natural science in 1883. He was a pupil of Prof. Dixon, at that time lecturer in chemistry at Balliol, and he also worked under Mr. Harcourt at Christ Church. On leaving Oxford, Mr. Baker went to Dulwich, where he remained until last May, when he was appointed head-master of the Alleyn's School. His election is naturally very popular, and Oxford will gladly welcome back one of her most distinguished chemists, particularly one who has shown that the duties of a schoolmaster are not incompatible with the carrying on of research.

On Saturday, February 14, a meeting of the resident members of the University who are interested in the teaching of natural science will take place in the examination schools to meet a deputation from the Association of Public School Masters, consisting of Mr. H. B. Baker, of Dulwich, Mr. Hill, of Eton, Mr. Sclater, of Charterhouse, and Mr. Shenstone, of Clifton. The following proposals of the association, respecting entrance scholarship examinations to the universities, will be brought before the meeting:—(1) That the science part of the examination should consist of (*a*) a paper on elementary physics and chemistry for all candidates; (*b*) papers and practical work in not more than four subjects: (i.) physics; (ii.) chemistry; (iii.) botany and zoology; (iv.) geology. Of these subjects, candidates must not offer more than two. (2) That very marked excellence in one of the four advanced subjects should have due weight.

CAMBRIDGE.—Mr. T. Manners-Smith, Downing, and Dr. Marett Tims, King's, have been appointed additional demonstrators of anatomy.

Mr. W. A. Cunnington, Christ's, has been appointed to work at the University table in the Naples Zoological Station.

The Library Syndicate report that the cost of providing suitable accommodation and catalogues for the Acton Library, presented by Mr. John Morley, will amount to more than 7300*l*.

Dr. MacAlister, Prof. Woodhead and Dr. Nuttall have been appointed to represent the University at the Brussels Congress of Hygiene and Demography, to be held next September.

The following have respectively been appointed electors to the professorships named:—*Chemistry*, Dr. T. E. Thorpe; *Plumian of Astronomy*, Mr. W. H. M. Christie; *Anatomy*, Dr. T. C. Allbutt; *Botany*, Mr. A. Sedgwick; *Geology*, Dr. S. F. Harmer; *Jackson of Natural Philosophy*, Lord Rayleigh; *Downing of Medicine*, Dr. A. Macalister; *Mineralogy*, Prof. J. J. Thomson; *Zoology*, Dr. D. MacAlister; *Experimental Physics*, Lord Rayleigh; *Mechanism*, Mr. O. Reynolds; *Physiology*, Prof. G. S. Woodhead; *Surgery*, Dr. A. Macalister; *Pathology*, Dr. W. H. Gaskell; *Agriculture*, Dr. W. Somerville.

Sir James Blyth, Bart., has been appointed a member of the Board of Agricultural Studies.

DR. VICTOR LEBEUF, of the University of Montpellier, has been appointed director of the astronomical observatory at Besançon, and Dr. Marcellin Boule to the professorship of palæontology at the Paris Natural History Museum.

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THE trustees of the Michigan College of Medicine and Surgery have established, the *British Medical Journal* states, two new chairs in tropical diseases with the object of preparing medical practitioners to deal with those affections in the Philippines and in Cuba. Dr. Robert S. Linn and Dr. V. J. Hooper have been appointed to the chairs.

THE fifth annual dinner of the Association of Old Students of the Central Technical College will be held at the Trocadero Restaurant, Piccadilly Circus, on Friday, February 20, at 7.30 p.m. Prof. W. C. Unwin, F.R.S., president of the Association, will take the chair. Tickets (price 5*s*. 6*d*.) can be obtained on application to the hon. secretary, Dr. E. F. Armstrong, 55 Granville Park, Lewisham, S.E.

IT is stated by the *Times* that the announcements recently made that Rhodes scholars have been elected in South Africa and the United States are inaccurate. The trustees have not yet awarded any scholarships. It is hoped that the scholars from the Cape Colony, Natal and Rhodesia may be elected in time to go into residence in Oxford in October next and also the first students from Germany, who are to be elected by the German Emperor, but the other scholarships will not commence before October, 1904.

THE effort made to clear off the debt of 5000*l*. on Bristol University College has, we learn from the *Times*, been successful. Sir William H. Wills and Sir Frederick Wills, M.P., agreed to give 1000*l*. each, provided that three like donations could be secured. In this the council of the college was not successful, but the offer was allowed to remain open on the understanding that the remaining 3000*l*. should be raised in any sums during the year. On the occasion of the recent University Colston dinner, it was announced that the 5000*l*. had been raised all but 500*l*. In the course of the evening, one of the guests gave 250*l*., and since then 700*l*. has been received, the total of 5500*l*. now reached including a contribution from the Bishop of the diocese, who presided at the dinner.

THE Government of the United Provinces is, the *Pioneer Mail* understands, considering the possibility of establishing a teaching university at Allahabad. The evidence given before the recent Universities Commission showed that the higher learning is almost entirely neglected by the Indian Universities, all the energies of their professors being taken up with pass work for the intermediate and B.A. examinations. The scheme which is being considered by the Local Government is that the Muir Central College should be strengthened and devoted to the higher branches of learning. The intermediate classes would be given up, and this work would be undertaken by a new college to be created for the purpose in Allahabad with its own principal and its own professors. Several new chairs would be added to the present college, and it would thus be able to devote its time to scholarship in the sense understood in Europe and to advanced work in science. In a recent speech, the Agha Khan, president of the Mohammedan educational conference, suggested that ten million rupees should be raised by voluntary subscription among the Mohammedan community to convert the Mohammedan Anglo-Oriental College at Aligarh into a university. It seems clear from such facts as these that educational requirements are receiving great attention in India.

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, January 21.—Prof. Emerson Reynolds, F.R.S., in the chair.—The following papers were communicated :—Researches on silicon compounds. Part viii. Interactions of silicophenylamide with thiocarbimides, by Prof. Emerson **Reynolds**. Silicophenylamide readily combines with one or two molecules of the thiocarbimides to form crystalline compounds, which dissociate into their generators at 100° C. ; it also reacts with thiocarbimides when heated in sealed tubes, with the formation of silicodiphenylimide and a disubstituted thiocarbamide.—On the relation between the absorption spectra and the chemical structure of corydaline, berberine and other alkaloids, by Drs. **Dobbie** and **Lauder**. It is shown that corydaline and tetrahydroberberine, which are known to possess similar constitutions, give absorption spectra which differ in general absorption, but show no specific absorption differences. This is found to be the case generally for related alkaloids, and the authors suggest that such observations may occasionally be useful in deciding between possible formulæ for an alkaloid.—Absorption spectra of laudanine and laudanosine in relation to their chemical constitution, by Drs. **Dobbie** and **Lauder**. An application of the results of the foregoing paper to these two alkaloids, which are shown to belong probably to the reduced berberine group.—Pheno*cyclo*heptene, by Dr. **Kipping** and Mr. **Hunter**. A description of the properties of this hydrocarbon.—The influence of molybdenum and tungsten trioxides on the specific rotations of *l*-lactic acid and potassium *l*-lactate, by Dr. **Henderson** and Mr. **Prentice**. These oxides increase the specific rotations of *l*-lactic acid and of its potassium salt, probably as the result of the formation of salts of the *tartar emetic* type.—Estimation of ethyl alcohol in essences and medicinal preparations, by Dr. T. E. **Thorpe** and Mr. **Holmes**. The mixture is diluted with water, saturated with sodium chloride and shaken out with light petroleum to remove volatile substances other than alcohol; the latter remaining in the residue is estimated in the usual manner.—Carbon monoxide as a product of combustion of the Bunsen burner, by Dr. **Thorpe**. A laboratory burner consuming 6 cubic feet of coal gas per hour under 0.95 inch pressure evolves 0.022 cubic foot of carbon monoxide when burnt under a sand bath at such a height that the inner cone just impinges on the metal of the bath.—The following papers are descriptive of the compounds mentioned, and are not of general interest :—Derivatives of β-resorcylic acid and of protocatechuic acid, by Dr. W. H. **Perkin**, jun., and Mr. **Schiess**.—Synthesis of *N*-ethyl-, *N*-methyl- and *N*-benzyl-benziminoethers, by Dr. **Lander**.—The condensation of phenyl ethyl ketone with benzalacetophenone and of acetophenone with benzalpropiophenone, by Dr. **Abell**.—Synthesis of 1 : 3 : 5 triphenyl-2 : 4-dimethyl*cyclo*pentane and of 1 : 3 : 5-triphenyl-2-methyl*cyclo*pentane, by Dr. **Abell**.—Formation of carbazoles by the interaction of phenols, in the orthoketonic form, with arylhydrazines, by Prof. **Japp** and Mr. **Maitland**. (1) Dimorphism of α-methylanhydracetonebenzil. (2) The oxidation products of the methyl homologues of anhydracetonebenzil, by Prof. **Japp** and Mr. **Michie**.—Action of hypobromites on amides, by Dr. **Lapworth** and Mr. **Nicholls**.—Derivatives of menthyl cyanoacetate, by Messrs. **Bowack** and **Lapworth**.—The influence of nitro-groups on the reactivity of halogen derivatives of benzene, by Dr. **Lapworth**. A restatement of the view that the reactivity of the halogens in *ortho*- and *para*-halogenated nitrobenzenes is due to the assumption of the elements of a molecule of water by the nitro-group, with subsequent intramolecular changes, leading to the production of a tautomeric form of a nitrophenol with the loss of a molecule of a haloid acid.

EDINBURGH.

Geological Society, February 5.—Dr. J. Horne presided.—Mrs. Dr. Ogilvie **Gordon** gave a demonstration of some of the results obtained by her geological survey of the Fassa district in South Tyrol, made in 1900–1901. The lecture, which was entitled "The Fassa-Monzoni District or Simultaneous Duplex Crust Movements," was illustrated by Mrs. Gordon's lantern views, geological maps and sections, rock specimens and mineralogical slides. In describing the succession of Triassic strata, Mrs. Gordon pointed out two distinct advances made by her work : (1) She had discovered the presence of Wengen-Cassian Marls with characteristic fossils in the midst of the Middle Triassic Limestones, whereas hitherto these fossiliferous strata had been reported to be absent in Fassa. The Wengen series comprise bedded tuffs and lavas, tufaceous grits, shales, and limestones like those in Gröden and Enneberg; the Cassian strata are chiefly marls and marly limestones. (2) She had determined the presence of a definite band of fossiliferous marls and Crinoidal and Oolitic Limestones between the Lower and Middle Trias, as a constant member in all undisturbed sections. Hitherto these limestones had been described as a rarely present facies of the lower horizons of Middle Triassic Limestones. The fossils collected in them by Mrs. Gordon were examined by Dr. Broili, Munich Museum, and identified by him as Upper Werfen (Lower Trias) or closely allied types. The establishment of this definite passage-zone between Lower and Middle Trias was an important addition to the geology

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